

## WHAT IS CLAIMED IS:

*SUB A<sup>1</sup>* 1. An apparatus for inserting side information in a communication system, comprising:

5 a channel encoder for encoding input data in a frame unit to generate encoded data symbols;

a side information generator for generating a number of said side information;

a selector for generating a select control signal designating positions into which said side information are inserted;

10 a side information inserter for inserting said side information between said encoded data symbols in response to said select control signal; and

a spreader for spreading the output of said side information inserter.

2. The apparatus as claimed in claim 1, wherein said channel encoder includes:

15 an encoder for encoding said input data in a frame unit to generate said encoded data symbols; and


a puncturer for puncturing said encoded data symbols generated from said puncturer by the number of symbols of said side information.

*SUB A<sup>2</sup>* 3. The apparatus as claimed in claim 2, further including an interleaver for

20 interleaving said encoded data symbols to supply the interleaved data symbols to said side information inserter.

4. The apparatus as claimed in claim 3, wherein said puncturer punctures said encoded data symbols in consideration of the number of symbols of said side information.


5. The apparatus as claimed in claim 4, wherein the number of symbols to be punctured is the same as the number of symbols of said side information.

SUB 5  6. The apparatus as claimed in claim 3, wherein said side information is a power control bit.

7. The apparatus as claimed in claim 3, wherein said selector generate said select control signal for pseudo-randomly designating a position into which said side information is inserted.

10 8. The apparatus as claimed in claim 3, wherein said selector generates said select control signal for periodically designating a position into which said side information is inserted at preset intervals.

15 9. The apparatus as claimed in claim 7, wherein said selector generates the least significant bits of a given number of a long code of previous power control group as said select control signal.

SUB A3  10. A method for inserting side information in a communication system, comprising the steps of:  
encoding input data in a frame unit to generate encoded data symbols;

puncturing said encoded data symbols;  
 inserting said side information between the punctured data symbols; and  
 spreading the symbols with said side information.

5 *Sum* 11. The method as claimed in claim 10, further including the steps of  
 interleaving said punctured data symbols to generate the interleaved data symbols as the  
 symbols between which said side information is inserted.

12. The method as claimed in claim 11, wherein the number of the punctured  
 data symbols is determined in consideration of the number of symbols of said side  
 information.

10 13. The method as claimed in claim 12, wherein the number of the punctured  
 data symbols is the same as the number of symbols of said side information.

14. The method as claimed in claim 13, wherein said side information is a  
 power control bit.

15 15. The method as claimed in claim 11, wherein said side information is  
 pseudo-randomly inserted between said interleaved data symbols.

16. The method as claimed in claim 11, wherein said side information is  
 periodically inserted between said interleaved data symbols at preset intervals.

17. The method as claimed in claim 15, wherein the position of said side information inserted between said interleaved data symbols is designated by the least significant bits of a given number of a long code of previous power control group.

SW 14  
5 } 18. A channel transmitter of a communication system, comprising:  
a cyclic redundancy check (CRC) generator for adding a CRC bit to input data in a frame unit;  
a tail bit generator for adding a tail bit to the output of said CRC generator;  
an encoder for encoding the output of said tail bit generator at a preset coding rate;  
10 a puncturer for puncturing symbols of a prescribed number of the output symbols of said encoder;  
an interleaver for interleaving the output of said puncturer;  
a selector for generating a select control signal designating a position into which side information is inserted;  
15 a side information inserter for inserting said side information between the output symbols of said interleaver in response to said select control signal; and  
an orthogonal modulator for orthogonally modulating the output of said side information inserter.

SW 10' } 19. The channel transmitter as claimed in claim 18, wherein said puncturer punctures the output symbols of said encoder in consideration of the number of symbols of said side information.

20. The channel transmitter as claimed in claim 18, wherein said side information is a power control bit.

21. The channel transmitter as claimed in claim 18, wherein said selector pseudo-randomly designates the position into which said side information is inserted.

5 22. The channel transmitter as claimed in claim 18, wherein said selector periodically designates the position into which said side information is inserted at preset intervals.

10 23. The channel transmitter as claimed in claim 18, wherein said selector generates the least significant bits of a given number of a long code of previous power control group as said select control signal.

SUB A5  
24. A transceiver of a mobile communication system, comprising:  
a channel encoder for encoding input data to generate encoded data symbols  
sequence;  
a puncturer for puncturing a number of said encoded data symbol sequence  
15 in consideration of the number of symbols of side information to be inserted;  
an interleaver for interleaving the punctured data symbol sequence;  
a side information generator for generating said side information;  
a selector for generating a select control signal designating a position into  
which said side information is inserted;  
20 a side information inserter for inserting said side information between the

interleaved data symbol sequence in response to said select control signal;

a transmitter for spreading the data symbol sequence having said side information to transmit the spread signal; and

5 a receiver for receiving said spread signal from said transmitter, wherein said receiver includes;

a finger for despreading said spread signal to generate a receiving signal sequence;

10 an inserting position selector for generating a control signal designating a position into which said side information is inserted; and

a demultiplexer for extracting said side information contained in said receiving signal sequence in response to said control signal generated from said inserting position selector.

25. The transceiver as claimed in claim 24, wherein the number of the punctured symbols is the same as the number of symbols of said side information.

15 26. The transceiver as claimed in claim 24, wherein said side information is a power control bit.

27. The transceiver as claimed in claim 24, wherein said selector generates said select control signal for pseudo-randomly designating the position into which said information is inserted.

28. The transceiver as claimed in claim 24, wherein said selector generates said select control for periodically designating the position into which said side information is inserted at preset intervals.

29. The transceiver as claimed in claim 27, wherein said selector generates the least significant bits of a given number of a long code of previous power control group as said select control signal.

SUB A<sup>6</sup> 30. A method for transmitting and receiving data in a mobile communication system, comprising the steps of:

- encoding input data to generate encoded data symbol sequence;
- puncturing a number of said encoded data symbol sequence in consideration of the number of symbols of side information to be inserted;
- interleaving the punctured data symbol sequence;
- generating said side information;
- generating a select control signal designating a position into which said side information is inserted;
- inserting said side information between the interleaved data symbol sequence in response to said select control signal;
- spreading the data symbol sequence having said side information to transmit the spread signal;
- despreading said spread signal to generate a receiving signal sequence;
- despreading a position into which said side information is inserted; and
- extracting said side information contained in said receiving signal sequence

in response to the designated position.

*SUB 10* 31. The method as claimed in claim 30, wherein the number of the punctured symbols is the same as the number of symbols of said side information.

5 32. The method as claimed in claim 30, wherein said side information is a power control bit.

33. The method as claimed in claim 30, wherein said position into which said side information is inserted is pseudo-randomly designated by said select control signal.

10 34. The method as claimed in claim 30, wherein said position into which said side information is inserted is periodically designated at preset intervals by said select control signal.

35. The method as claimed in claim 33, wherein said position into which said side information is inserted is designated by using the least significant bits of a given number of a long code.

*add A<sup>7</sup>*